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Dear Helen:

Thank you for letting me see your manuscript. It is of course a great pleasure to see this story unfold, even if we have now redirected the research here completely to the *B. subtilis* system.

Is there no indication that the expression of V is also conditioned by a lysogenic conversion?

You probably know what has been going on here from papers in Genetics, J. Mol. Biol. and PNAS. When we can eventually get around to it, some reprints will be mailed out too. Gan has a very interesting project now, the association of DNA synthesis with a complex of RNA, protein and DNA probably at the cell wall.

Since you were here I have become very much interested in the development of computers for biological research, since Stanford actually has one of the world's leading facilities for computer research. There are some complex questions of strategy and it is rather slow getting this moving—what a paradox, considering microsecond operational speeds! So far the main efforts are rather mathematical and in chemistry rather than biology. If you are especially interested let me know, and you will also see something in the January 1965 PNAS.

Ollie will be amused to learn we also have a rather extensive program in genetic demography, using the 2×10^7 records of the U.S. 1960 census (5% sample). Among other things we certainly will extract what we can on sequence of sexes. So far we see nothing very clearcut on, e.g., interval between children by sex of previous child, but have much more to do. Any suggestions (even if they may seem obvious and of course most of the plan will be obvious) would be welcome. We have a rather unusual arrangement with the Census Bureau to be able to study these data directly.

While you were here I was perhaps just in the transition between working mainly with my own hands in the lab, and being responsible for a larger group. The former is much pleasanter in many ways, and it takes some time both to acquire some efficiency in the second role and to subdue resentments about leaving the first. One advantage of computation is that (in a sense) the machines can carry on even while one is interrupted. It takes a lot of thought, but this can be applied at any time or place. Eventually we will be literally programming the machines to execute our experiments; it will take a little longer before the machines will be programming us.

Best wishes,

Joshua Lederberg
Professor of Genetics

P. H. Makela